DOCUMENT RESUME

ED 153 469 FL 009 384

AUTHOR	Kellerman, Eric
TITLE	Giving Learners a Break: Native Language Intuitions as a Source of Predictions about Transferability. Working Papers on Bilingualism, No. 15.
INSTITUTION	Ontario Inst. for Studies in Education, Toronto. Bilingual Education Project.
PUB DATE	Mar 78
NOTE	36p.; For related documents, see FL 009 381-384
AVAILABLE FROM	Bilingual Education Project, The Ontario Institute for Studies in Education, 252 Bloor St. West, Toronto, Ontario, Canada M5S 1V6 (as long as supply lasts)
EDRS PRICE	MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS	Bilingualism; Dutch; *English (Second Language); German; Idioms; *Interference (Language Learning); Language Research; Learning Characteristics; *Learning Processes; *Psycholinguistics; *Second Language Learning; *Semantics; Translation; Vocabulary
IDENTIFIERS	*Interlanguage; Intuition

ABSTRACT

The strategy of "transfer" of native language (NL) items into target language (TL) expressions is considered here to be an active learner strategy dependent on the learner's notion of "distance" between the NL and the TL. Some NL items will be more liable to transfer than others to the extent that they are believed to be less native language-specific. For example, a polysemous lexical item will have a field of meaning in which the "core" meaning may be more likely to be transferred than more idiomatic or figurative meanings. This strategy is evidenced by Dutch learners of English (and German) in their judgments of acceptability of expressions using "break" (or "brechen") where Dutch can use the equivalent "breken." (Author/CFM)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

ED153469

Giving learners a break: native language intuitions as a source of predictions about transferability

Eric Kellerman

University of Nijmegen, the Netherlands

Abstract

The strategy of 'transfer' of native language (NL) items into target language (TL) expressions is considered here to be an active learner strategy dependent on the learner's notion of 'distance' between the NL and the TL. Some NL items will be more liable to transfer than others to the extent that they are believed to be less native language-specific.

For example, a polysemous lexical item will have a field of meaning in which the 'core' meaning may be more likely to be transferred than more idiomatic or figurative meanings. This strategy is evidenced by Dutch learners of English (and German) in their judgments of acceptability of expressions using BREAK (or BRECHEN) where Dutch can use the equivalent BREKEN.

FL009384

U S DEPARTMENT OF HEALTH EDUCATION & WELFARE NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

Eric Kellerman

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC) AND USERS OF THE ERIC SYSTEM."

Giving learners a break: native language intuitions as a source of predictions about transferability[1]

Eric Kellerman
University of Nijmegen, the Netherlands

In Kellerman (1977), an attempt was made to characterise a 'strategy of transfer' in second language learning, whereby a learner with a given native language (NL) could use that language to make predictions about the target language (TL), transferring NL forms and features whenever it was felt they could be successfully employed in the TL ('projection'), after suitable adjustments had been made according to the supposed constraints imposed by TL surface structure ('conversion'). The learner could 'project' a) so as to fill a perceived gap in his knowledge of the TL, or b) because the learner believes that NL and TL are identical either in very specific detail or in more general terms. Much will depend on the learner's notion of 'distance' between NL and TL; the closer the TL to the NL, the more likely a strategy of transfer is to be used. It should be said here that transfer can be used by a learner as a communicative strategy as in a) above, or as a learning strategy as in b) above, or naturally, as both at the same time.[2]

In the same paper, it was pointed out that if the learner did not believe that a particular NL form or feature could have a parallel existence in the TL, he would not, in the normal run of things, transfer. Thus for a given learner with a given TL, it would be possible in theory to list those items in his NL he considered 'language-specific', and thus not transferable to the given TL, and those he considered 'language-neutral', i.e. transferable to the given TL. The TL itself is important here, since NL items should not necessarily be seen as somehow <u>inherently</u> either transferable or non-transferable. Item NL_x, for instance, may be labelled as 'specific' in terms of TL_a, but 'neutral' in terms of TL_b. Additionally, with the increase of 'real' knowledge of the TL on the part of the learner (i.e. when both learner and some external authority agree independently that the language the learner produces <u>is</u> the TL), the assignment of these labels to NL items will be under constant revision.

There may well be NL items, however, which are more likely to remain assigned to one category or the other, and which depend to a lesser extent on notions of NL-TL distance (within certain limits, perhaps) or the level of learning. The following categories were put forward in Kellerman (1977):

Language-specific:		proverbs, catchphrases, slang expressions, (picturesque) idiom
	:	inflectional morphology, except in very closely related languages
Language-neutral	:	internationalisms
	:	Latinisms
	:	borrowings from other modern languages, especially if apparently from the TL itself
	:	language-dependent concepts
	:	writing conventions

To these items could be added many of the items not included above occupying the middle region of the gradient Propositional-Automatic Speech Modes, as formulated by Van Lancker (1975), i.e. greetings, formulas, clichés, exclamations, expletives, curses. Such items are, according to Van Lancker, 'frequent and familiar'.

An experiment was then described, designed to test how Dutch learners of English at university level would react to picturesque Dutch idioms if they were translated into English. What happened was that students tended to reject such translations as not being good English, irrespective of whether these idioms existed in English or not. Third-year students were better at spotting which idioms were correct in both English and Dutch ('real' knowledge) but also tended to be slightly more generous to those which were not, suggesting that while they may have learnt a great deal about what is possible in English, they still had something to learn about what is not. First-year students tended to reject all idioms if they were Dutch-like. Thus, on the evidence of these experiments (plus much that is anecdotal) this kind of idiom is characteristically treated as language-specific, a state of affairs that only the acquisition of 'real' knowledge will alter, at which point we can no longer talk of a 'strategy of transfer' or even 'transfer' at all.

The rest of this paper will be devoted to testing the notions of 'language-specific' and 'language-neutral' in another area of lexis, with a view to answering the question as to why linguistic items should be seen as relatively transferable or non-transferable.

The fact that a certain kind of idiom is not seen as transferable between two such relatively close languages as Dutch and English indicates that learners possess some kind of filtering device which stops such items from being projected. If this phenomenon of 'non-transferability' were exclusively to be found

amongst advanced learners, we might say that teaching methods, with their accent on language differences, were responsible. But it seems rather generally true, irrespective of the level of education of the Dutch learner of English: true for school-children, university students, and doctors and nurses brushing up their English. Admittedly it might not be the case for people who have 'acquired' a TL rather than 'learnt' it in the classroom, or for naive learners (beginners with no other language learning experience, perhaps). However, for the purposes of this paper, discussion will be restricted to 'learners'.

One clue as to the factor or factors which lead learners to judge translated idiom as incorrect is provided by their own verbal reactions to those translations. Typically, they are described in such terms as 'silly', 'ridiculous', or more interestingly 'too Dutch', 'impossible in English' or greeted with hoots of laughter. It is very difficult to elicit further information on this point without going round in circles. However, what seems to be happening, on the basis of these observations and the experiment, is that learners size up their own language, and evaluate idiomatic expressions as 'marked'. A marked form is unusual, limited in scope or context, idiosyncratic, infrequent or anything else that indicates its special status. It is not difficult to see why idiomatic expressions should be seen as marked, since they are, amongst other things, often transformationally defective, and the sum of the parts rarely equals the meaning of the whole. Nor do they allow the free and easy commutability of their non-idiomatic structural counterparts. Thus, the learner's reasoning might go, such forms, being already 'marked' in the NL, and so typical of it, are hardly likely to have an identical parallel existence in the TL. Notions of markedness in the NL will no doubt interact with notions of NL-TL distance, as well as 'real' knowledge, in the decision to transfer or not. In a situation where the learner has no knowledge, it would seem theoretically reasonable to assume that the closer the learner believes the two languages to be, the more notions of markedness will affect decisions to transfer. However, with languages seen as very different, the strategy of transfer may never be used at all (cf. Corder's 'restructuring' vs. 'recreating' strategy, Corder forthcoming).

This interaction can be shown diagrammatically as follows:

(+ signifies 'the learner will transfer this item'
- signifies 'the learner will not transfer this item')

	TL relation to NL close → distant				
	A	B	C	D	E
1	+	+	+	+	+
2	+	+	+	+	-
3	+	+	+	-	-
4	+	+	-	-	-
5	+	-	-	-	-
6	-	-	-	-	-

NL items increasingly marked

Figure 1: Interaction of 'markedness' and 'language distance' in respect of transferability

As Jordens (personal communication) has made clear, the notion of markedness as a factor in transferability can probably be extended beyond the bounds of lexis and into syntax. This is not the place to report on his work, but it does appear from it that native speakers are more willing to transfer (or to allow in translation) syntactic structures which are productive in the sense that they allow for considerable paradigmatic variation, than those which are transformationally and semantically related yet whose structural description is restricted paradigmatically. As a brief example of what is meant, of the two sentences

You can cut bread extraordinarily well with this knife.

and

This knife cuts bread extraordinarily well.

the first will generally be adjudged more transferable than the second. However, we must also take into account the fact that syntactic 'markedness' is also affected by the meaning of the surface structure string, rather than the deep structure meaning. Thus in the above pair of sentences, one cannot rule out the possibility that learners scan the string, and realizing that knives do not cut without human agency thus stigmatise the second sentence as odd on semantic grounds. (Further evidence of surface structure meaning scanning will be given below.) However, Jordens' findings also show that where syntactic structures cannot be responsible for differences in surface structure meaning, the more productive structure is always adjudged more transferable (i.e. where one verb can take two forms of complementation), as in

Er behauptet es zu wissen. (less transferable)

and

Er behauptet dass er es weiss. (more transferable)

Intuitions about markedness are most probably dormant or 'potential' until the native speaker's attention is specifically drawn to the issue. This is precisely the point made by Lehrer (1974), who also found that while subjects' judgments about homonymy and synonymy were fairly stable, judgments about polysemy were liable to be influenced by extraneous factors and were unstable. A more natural context in which such intuitions would be activated is provided by communication in the TL, particularly when the learner's perception of 'language distance' does not rule out the use of transfer as a strategy. It seems reasonable to speculate that the learner imposes his psycholinguistic map of the NL onto the TL to the extent that his knowledge of the TL ('real' or otherwise) and of NL-TL relationships will let him. The trouble is that so far, the only aspect of this superimposition that has been studied is the linguistic phenomenon known as interference, but interference is at most only half the story.[3]

Semantic distance, BREAK, and transferability

So far, a limited number of examples have been put forward where there has been a relationship between 'markedness' and transferability. In all these cases, the items selected for testing (idioms and syntactic structures) have been placed in an actual or implied dichotomous setting, i.e. [+ idiom] (marked) vs. [- idiom] (unmarked), [- (grammatically) productive] syntactic structure (marked) vs. [+ productive] syntactic structure (unmarked). In each case, the marked form has been judged by learners as less transferable or acceptable in translation than the unmarked form. A more rigorous test of the hypothesis that 'markedness' is a key factor in transferability would be to take larger numbers of linguistically related NL items, arrange these along a gradient of 'marked/unmarked', and see how this arrangement correlated with learners' willingness to transfer the items to the TL. If we may now formulate a working hypothesis, there must be a positive correlation between degrees of markedness and the relative transferability of an item.

A morphosyntactic 'word' with a wide range of meanings is an ideal candidate for such a test. Such a 'word' may possess quite distinct meanings, homonyms perhaps, like the various distinct meanings of TRUNK. The meanings may rather be evidence of polysemic relationships, as between these examples of PLAY:

They played football
We played in 'Macbeth' together
She does actually play the piano

Or the meanings may be divided up into literal meanings and metaphorical extensions, as in the case of HEART ('vital organ' and 'courage', etc.). A 'word' that fills the bill nicely in all these respects is the verb BREAK, or more relevantly in the present study, the Dutch equivalent, BREKEN. This is not the place to enter into discussions about what homonymy and polysemy are, or how we can unambiguously define them, since it is a problem that admits of no easy solution in the case of BREKEN/BREAK, let alone in general terms. Nor is it particularly relevant to this paper. The various meanings of BREAK, to complicate matters, can all be subsumed under a 'deep' meaning, '(cause) not to continue in existing state', which links even the most disparate meanings of BREAK.[4] Here are examples of the various meanings of BREAK, restricted to simple forms only (i.e. no phrasal, prepositional, or phrasal prepositional verbs included):

He broke the cup*
He broke his leg*
My radio's broken (not function)
The waves broke on the shore* (disintegrate, cease moving)
His fall was broken by a tree* (stopped or interrupted, reduced in force)
He broke his journey in Delhi (interrupted)
Jane broke his heart* (hurt emotionally etc.)
They are always breaking promises/appointments/the law* (failing to keep)
At last they broke the enemy code (cracked, solved)
"The man who broke the bank at Monte Carlo" (emptied the coffers, rendered penniless)
He broke wind (caused wind to escape violently)
Who's going to break the news? (announce)
The storm broke ('erupt')
When will the weather break? (change)
Several workers broke the strike* (deliberately ignored)
The police broke the enemy resistance* (ended)
Failure left him a broken man* (emotionally ruined)
His voice broke when he was 13* (changed pitch)
It took a few drinks to break the ice* (ease the tension)
The East Germans today broke yet another record* (bettered)
Concorde broke the sound barrier (passed through)
Nobody could break the witch's spell (destroy the power of)
He could make the ball break both ways (change direction on hitting the ground)

etc.

The range of meanings displayed above is reflected in the complexity of dictionary entries for this verb, both in English and Dutch. Dutch BREKEN has many of the meanings listed above

(marked with an asterisk), sufficient to use this word for the experiments shortly to be described. Before this is done, one observation can be made. It is possible, certainly on intuitive grounds, to select the meaning enshrined in 'he broke his leg' as the 'core' meaning of BREAK of a solid ([cause to] separate into two or more parts as a result of e.g. a blow). This is the definition or characteristic example of the definition that native speakers will produce first if asked to define BREAK. Not to do so would be perverse. In the same way, a request for a definition of a word like 'blue' should yield a reference to 'colour' before 'depression', 'jazz' or 'dirty jokes or films'. With such words as the noun 'trunk' there should be no preference between the definitions 'large bag', 'part of tree', 'part of elephant' on a priori grounds. The 'core' meaning is thus the unmarked meaning, and its 'coreness' will no doubt be a composite of high frequency of occurrence, syntactic flexibility, literalness or concreteness, etc. It would be more difficult to assign degrees of 'coreness' to non-core items on a priori (e.g. linguistic) grounds. An immediate problem arises as to whether metaphorical extensions of the 'core' meaning are as 'non-core' as meanings which seem at least partially homonymous. Thus it is difficult to relate 'breaking hearts' and 'breaking voices' to the 'core' meaning and to each other according to a linear attribute. The problem of grading the meanings clearly exists in more than one dimension.

Table 1 presents a rough partial analysis of the various meanings of BREAK (using semantic and syntactic criteria). The analysis is not to be taken as a means of defining 'core', though no doubt the closer a meaning to the 'core', the more features will be shared with it. No attempt is made to weight the features with respect to their importance in defining core, and no account of frequency is taken, since information available from word counts is restricted to the 'word' BREAK and does not include an analysis of frequency of the various meanings.

How native speakers (with university education) in fact perceive the meanings of BREAK in terms of mutual semantic distance is of course more relevant than any linguistic analysis in predicting transferability, even though it would be preferable to have a linguistic method for determining 'coreness' without constant recourse to groups of native speakers. For a complex system of the BREAK kind, only crude categorizations can be made. Certain meanings are literal, or metaphorical, certain seem closer to the 'core' meaning, but a great number of these listed above cannot be placed happily in any category. At this exploratory stage it would appear more useful to attempt to see how native speakers arrange the various meanings in relation to each

	CUP	CLEAN	KNIFE	SAND	RESIST	TRAIN	ANDIRON	MAGNET	HEARD	ECHO	RESIST	RESTORE	AGREE	MEMORY	NOISE	SOUND	BAR	PROFIT	MAIL	JOURNEY	APPOINT	TODAY	DEAL	SPOIL	BEAT	WEAK	WIDOW	WEIGHT	HALO	BOOK	CLOD	STEM	SAW	VERSE	Example
ACTIVE FORM	+	+	+	+	+	+	+	+	+	+	+	+	+	+	−	+	+	+	+	+	+	+	+	+	+	−	?	+	−	−	He broke the cup
PASSIVE FORM	+	+	+	+	+	+	+	+	+	+	+	+	+	+	−	+	+	−	+	?	−	+	+	+	−	−	−	−	+	−	−	The cup was broken
INTRANSITIVE	+	+	+	+	+	−	+	−	−	−	−	+	+	−	−	−	−	−	−	−	−	−	−	−	−	−	+	+	−	+	+	The cup broke
A BROKEN ——	+	+	−	−	+	+	+	−	−	+	+	−	?	−	−	+	−	−	+	−	−	+	−	−	−	−	−	−	+	−	−	A broken cup
SMASH	+	+	−	+	−	−	−	+	−	−	−	−	?	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	+	−	+	He smashed the cup
MEND	+	+	+	−	+	−	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	You can mend a cup
DISINTEGRATE	+	+	+	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	+	The cup disintegrated
SHATTER	+	+	−	+	−	+	−	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	He shattered the cup
FRAGILE	+	?	+	?	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	Cups are fragile
CRACK	+	−	+	?	−	−	−	−	−	−	−	−	+	−	−	−	−	−	−	−	−	−	−	−	−	−	+	−	−	−	−	This cup is cracked
CRUSH	+	+	−	+	−	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	He crushed the cup underfoot
CRUMBLE	+	−	?	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	The cup crumbled in his hand
BREAKABLE	+	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	+	−	−	−	−	Cups are breakable
SPLIT	−	−	+	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	His skin split
PIECES	+	?	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	+	The cup broke into several pieces
REPAIR	+	−	−	−	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	The cup can be repaired
SPLINTER	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	The cup splintered
BRITTLE	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	These cups are very brittle

67

10

Table 1: Partial analysis of BREAK

11

other and to the 'core' meaning. It has already been suggested that this 'semantic space' would probably not be linear. There are a number of relevant questions deriving from an analysis of a non-linear 'semantic space':

a) in a multidimensional space does the arrangement in space of meanings equidistant from 'core' relate to transferability?
b) does increasing distance from core of a meaning entail reduced transferability (i.e. linearly)?
c) are 'concrete' meanings more transferable than 'abstract' ones?
d) can a metaphorically extended 'core' meaning also maintain its 'coreness', as far as transferability is concerned?

Investigations into native speakers' intuitions about semantic distance

In the investigations described here into native speakers' intuitions about 'semantic distance', leading to a generalised 'semantic space' that shows the interrelationships of meanings of BREKEN, two techniques for tapping these intuitions were used. The first was based on judgments of dissimilarity between pairs of meanings of BREKEN; the second consisted of the sorting of the various meanings of BREKEN according to the criterion of similarity, using a method first described by Miller (1969).

a) Judgments of dissimilarity between pairs of meanings.

35 native speakers of Dutch, all either students or staff in the Faculty of Letters at Nijmegen University (none of whom was involved in the transferability experiment described below) were asked to consider the difference in the meanings of BREKEN in 36 pairs of sentences, formed from all possible pair combinations of the following nine sentences:

1. de golven braken op de rotsen (the waves broke against the rocks)
2. zijn stem brak toen hij 13 was (his voice broke when he was 13)
3. 't kopje brak (the cup broke)
4. zijn val werd door 'n boom gebroken (his fall was broken by a tree)
5. hij brak zijn woord (he broke his word)
6. na 't ongeluk is hij 'n gebroken man geworden (after the accident he has become a broken man)

7. hij brak zijn been (he broke his leg)
8. zij brak 't wereldrecord (she broke the world record)
9. zij brak zijn hart (she broke his heart)

Although it would have been possible to increase the number of sentences containing BREKEN to include more shades of meaning of the verb, this was not done, partly in order to maintain perfect Dutch-English meaning-form correspondence in the test items, and secondly to prevent an already difficult test from becoming unwieldy. Since the number of pairs which can be produced from nine items is already 36

$$\left(\text{number of pairs} = \frac{\text{number of items (number of items - 1)}}{2} = \frac{9(9-1)}{2}\right)$$

it will be seen that even the addition of one more sentence would increase the number of pairs to $\frac{10\ (10-1)}{2} = 45$, and 11 sentences would produce 55 pairs. A trial run with 45 pairs had shown that a number as large as this made the test very trying for subjects, who reported that their judgments became increasingly unmotivated. Consequently the number was reduced to 36 pairs.

A third reason for using only BREKENs that can be directly translated into English while retaining their meaning will be discussed in the section relating to the transferability experiment.

Subjects were presented with a list of 36 pairs of sentences in random order. The task for subjects was to decide the degree of dissimilarity in meaning between the BREKENs in each pair according to a five-point scale where

1 signified: the meanings of the BREKENs in a given pair are identical
2 signified: the meanings of the BREKENs in a given pair are closely related
3 signified: the meanings of the BREKENs in a given pair have some relationship
4 signified: the meanings of the PREKENs in a given pair have virtually no relationship
5 signified: the meanings of the BREKENs in a given pair are totally different

This method is very similar to the one described by Lehrer (1974) to obtain judgments about homonymy and polysemy. The instructions, which were given verbally, asked subjects to concentrate on meanings only. Thus there were 35 x 36 = 1260 judgments in all. The ratings for each pair were added up, producing the following dissimilarity matrix, where the higher a cell score

the more dissimilar a pair are adjudged:

sentence number									
	1	leaves							
2	[illegible]	2	voice						
3	93	124	3	cup					
4	99	[illegible]	132	4	fall				
5	136	131	136	142	5	word			
6	141	129	134	145	126	6	man		
7	100	147	46	140	138	135	7	leg	
8	132	132	130	147	119	144	121	8	record
9	125	124	129	147	107	76	116	133	9 heart

Table 2: Raw data dissimilarity matrix

One could just as well construct a similarity matrix with the value of the ratings being reversed, of course.

The maximum theoretical score for any cell is (35 x 5 =) 175, and the minimum is (35 x 1 =) 35. The highest actual score is 147 (3 times), an average of 4.2 per subject, and the lowest is 46 (cell 7,3), an average of 1.31 per subject. Thus, on the basis of this matrix, it appears that subjects see BREKENs 3 and 7 as very closely related in meaning. This is to be expected since the two sentences in question are 'he broke his leg' and 'the cup broke', both examples of what one would hypothesise as 'core' meanings.

A dissimilarity matrix of this kind is suitable for multi-dimensional scaling by computer, with a view to the arrangement of items along dimensions that may be suggestive of some desired feature, such as 'core-non-core' or 'literal-figurative', etc. A simpler test based on, say, the relatedness of the various BREKENs to an assumed 'core' BREKEN (7 or 3) would have produced only a linear ordering. Thus if we refer to Table 2 above, the pairs 7,5 and 7,6 receive very similar dissimilarity scores of 138 and 135 respectively, placing them very close together on a linear ordering based on 7. In fact the pair 5,6 has a dissimilarity score of 126. Thus the relationship of 5, 6 and 7 can only be fully represented in two dimensions. It will be clear from Figure 2 that the two-dimensional scale is far more informative than the linear scale:

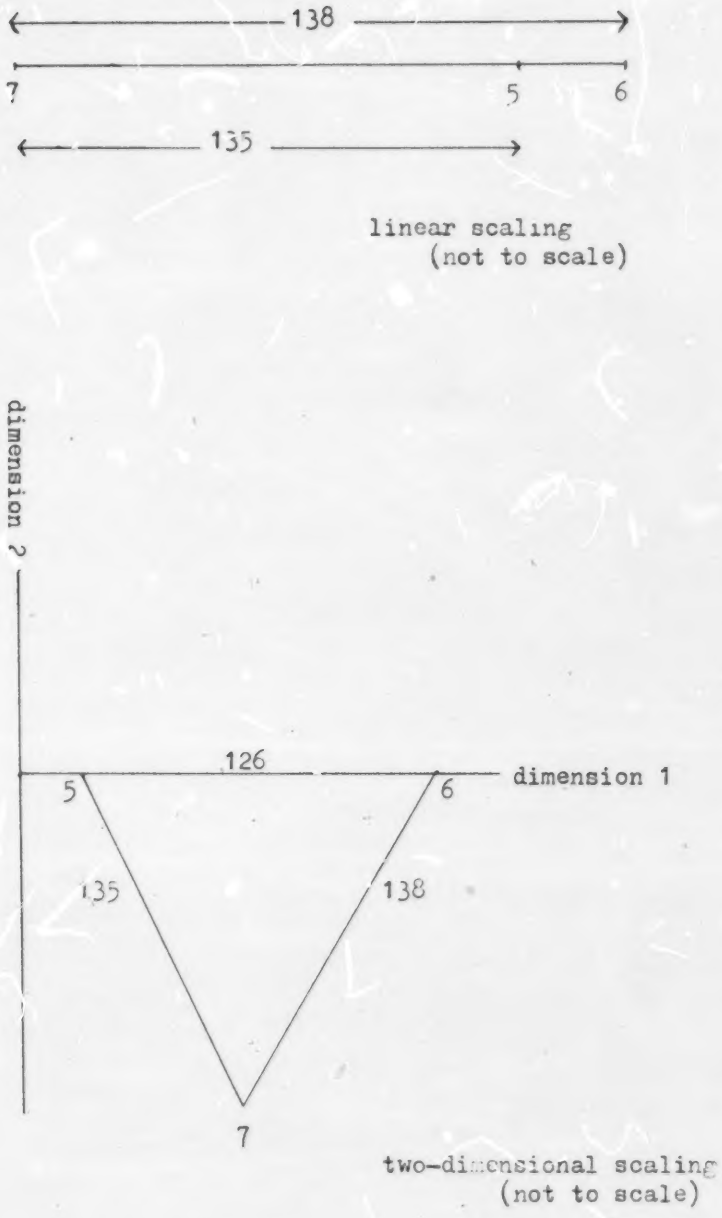

Figure 2: Two-dimensional vs. linear scales

The linear figure suppresses information, and is inadequate in representing the true nature of the relationship between the three items. This inadequacy can be expressed in terms of 'stress'. In the linear scale, the stress is high since a certain amount of violence is being done to the facts. In the two-dimensional scale there is no stress; the facts are fully accounted for. If there are a large number of items to contend with (nine in our case) it is theoretically (if not visually) possible to map out an eight-dimensional space, but needless to say, such spaces are difficult to conceive of, and the actual dimensions themselves would not be meaningful. However, it is often possible to 'squeeze' the multi-dimensional space, reducing the number of dimensions to as few as three or two without introducing a degree of stress which will significantly distort the facts. The degree of stress can be calculated, and as long as it remains tolerably low, dimension reduction can continue. If it could be shown that our nine items can be arranged in such a reduced space of, say, three dimensions, then there is some hope that the arrangement of items along a dimension could be given a meaningful and relevant interpretation - needless to say, whatever inferences are made are up to the investigator and must serve only as a source of hypotheses for further investigation.

The dissimilarity matrix in Table 2 was fed into a computer and analysed multidimensionally according to the 'Minissa' program developed by Roskam, Lingoes and Raaymakers. The eight dimensions implicit in the matrix could be reduced to three with a tolerable stress level. The question now is to determine whether any of the three resultant dimensions can be interpreted usefully.

The computer print-out consists amongst other things of three diagrams, each representing the arrangement of the items in the three-dimensional space, but with one dimension not represented visually on paper, since naturally only two dimensions can be drawn on a flat sheet. The reader of such a print-out can imagine the third dimension as lying between him and the print-out, at right angles to the plane of the paper. The effect is rather as if one were looking through the sides of a transparent box in which the items were arranged in three dimensions, but with one eye closed! The sense of 3-D would be lost, and only two dimensions could be seen at any one time.

In the print-out of dimension A vs. dimension C (Figure 3), some kind of interpretation looks possible, although the items are too few for comfort, and the general picture is not really encouraging:

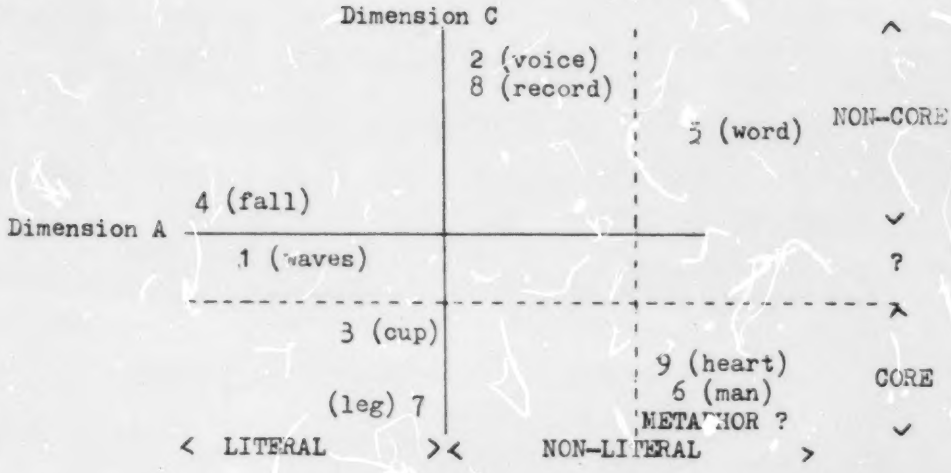

Figure 3: Multidimensional scaling (MDS) of BREKENs

Dimension C looks as if it might represent a scale of 'coreness'. As was discussed above, the BREKENs in sentences 3 and 7 ('cut' and 'leg') are assumed to represent the 'core' meanings, with 9 ('heart') a metaphorical extension. 6 ('man') may also be seen in this way. 2 and 8 ('voice' and 'record') are at the 'non-core' end of the dimension. Dimension A looks like an imagery scale.[5] Certainly 1, 3 and 7 ('waves', 'cup' and 'leg') are literal, and 5, 6 and 9 ('word', 'man' and 'heart') are metaphorical. 2 and 8 ('voice' and 'record') are again problematic. If the hypothesis that 'coreness' determines transferability is correct, and dimension C can be interpreted as 'coreness' then the arrangement of the BREKENs along that dimension should correlate with transferability data. If we look at the co-ordinates for the three dimensions for each item (from which the position in space of each item is plotted) we obtain the following rank order of co-ordinates along dimension C:

Meaning	Rank order on dimension
7 (leg)[a]	1
6 (man)	2
9 (heart)	3
3 (cup)	4
1 (waves)	5
4 (fall)	6
5 (word)	7
8 (record)	8
2 (voice)	9

[a] (the nouns in brackets service as a mnemonic for the meaning of BREKEN)

Table 3: Rank order of items on putative 'core' dimension

We will return to the rank order later.

b) Card sorting.

The card sorting method used here is that developed and described by Miller (1969) to investigate the structure of the mental lexicon. In his study subjects were asked to sort 48 nouns typed separately on cards into piles according to 'similarity of meaning'. The subject could form as many or as few piles as he liked, with as few or as many cards as he chose in each pile. It is Miller's contention that people will sort cards together according to shared semantic features, thus overlooking the features that would normally distinguish one noun from another; thus by pooling data from a number of subjects the number of times a given pair of nouns appeared together in the same pile (with 50 subjects the theoretical maximum is 50) can be seen as a measure of similarity of the two items. The higher the number, the greater the subjects adjudged the similarity of meaning.

50 native speakers of Dutch (all either students or staff in the Faculty of Letters at the University of Nijmegen) took part in this investigation. Some of them had also taken part in the previous investigation and some had also taken part in the transferability experiment described below. However, a considerable amount of time had elapsed between these investigations, and since none of the subjects had been told of the purpose of the experiment, it is unlikely that their responses have skewed the results.

The subjects were presented with 17 cards, on each of which was written a sentence containing BREKEN. Among the 17 were the nine from the previous experiment (marked with an asterisk). The 17 sentences were as follows:

1. De golven braken op de rotsen* (The waves broke on the rocks)
2. De lichtstralen breken in het water (The light rays refract in water)
3. Hij brak zijn been* (He broke his leg)
4. 't Kopje brak* (The cup broke)
5. Na 't ongeluk is hij 'n gebroken man geworden* (After the accident he became a broken man)
6. Zij brak zijn hart* (She broke his heart)
7. Hij brak zijn woord* (He broke his word)
8. De man brak zijn eed (The man broke his oath)
9. Welk land heeft de wapenstilstand gebroken? (Which country has broken the ceasefire?)
10. Sommige arbeiders hebben de staking gebroken (Some workers have broken the strike)

11. Nood breekt wet (Necessity breaks law)
12. Dankzij 'n paar grapjes was 't ijs eindelijk gebroken (Thanks to a few jokes the ice was finally broken)
13. 'n Spelletje zou de middag enigszins breken (A game would break up the afternoon a bit)
14. Zij brak 't wereldrecord* (She broke the world record)
15. Zijn stem brak toen hij 13 was* (His voice broke when he was 13)
16. Zijn val werd door 'n boom gebroken* (His fall was broken by a tree)
17. Het ondergrondse verzet werd gebroken (The underground resistance was broken)

The additional sentences were chosen to enlarge the amount of material that could be incorporated into the transferability experiment, thus providing a broader base on which to test the principal hypothesis that 'coreness' correlates positively with transferability. A possible advantage of having a larger number of items would be to improve the quality of multidimensional scaling - the more items, the more clearly any potential scale will be revealed. Should a 'core' dimension again suggest itself, it will involve 17 items rather than 9.

Of the above sentences, 1, 3-9, 10, 12 and 14-17 have exact English equivalents. 11 ('nood breekt wet') can be literally translated as 'Necessity breaks law', and is proverbial. It is the only case in Dutch of '<u>breaking</u> the law'; normally the appropriate word is 'overtreden'. 9 is problematic as it appears that some, if not all, Dutchmen would not say 'de wapenstilstand <u>breken</u>', but '<u>verbreken</u>'. There is thus some argument for not including these two items in the transferability experiments.

Not only is Miller's method a means of obtaining more information than the comparing of pairs of meanings (i.e. 17 meanings of BREKEN rather than 9), it is probably more reliable, and certainly more enjoyable for subjects, for whom it takes on something of the nature of a game. The number of piles made by subjects varied from 2 to 15, with an average of 7.28 and a standard deviation of 2.95; some subjects finished in five minutes, others took up to 20 minutes.

From the data produced by card sorting, a matrix, this time of <u>similarities</u>, was produced, based on the number of times subjects had put any two sentences in the same group. The matrix is as follows:

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1	waves																
2	35	2	light rays														
3	15	14	3	leg													
4	14	14	45	4	cup												
5	3	3	2	1	5	man											
6	3	3	1	1	41	6	heart										
7	3	3	0	0	8	15	7	word									
8	3	3	0	0	8	15	50	8	oath								
9	4	5	0	0	4	7	20	21	9	ceasefire							
10	3	3	0	0	4	7	18	19	45	10	strike						
11	2	2	0	0	7	9	26	25	20	7	11	law					
12	6	8	6	6	9	11	8	9	7	2	10	12	ice				
13	4	5	0	0	5	5	5	6	8	2	6	22	13	game			
14	4	7	3	3	6	9	13	13	15	3	13	8	8	14	record		
15	7	9	2	2	6	7	4	5	3	0	6	8	6	9	15	voice	
16	18	15	5	7	1	4	5	4	4	3	1	6	6	2	11	16	fall
17	4	4	0	0	2	6	15	16	34	11	17	6	6	11	4	6	17 resistance

Table 4: Similarity matrix of meanings of BREAK

Thus sentences 7 and 8 were sorted into the same pile by all 50 subjects, while no one placed either 3 or 4 in the same pile as 7, 8, 9, 10, 11, 13, or 17. Nor were 10 and 15 sorted together. There is also relatively little 'noise' in the matrix.

This matrix was also submitted to computer analysis using the Minissa program. Again the number of dimensions can be reduced comfortably to three (Figure 4) and even two (Figure 5).

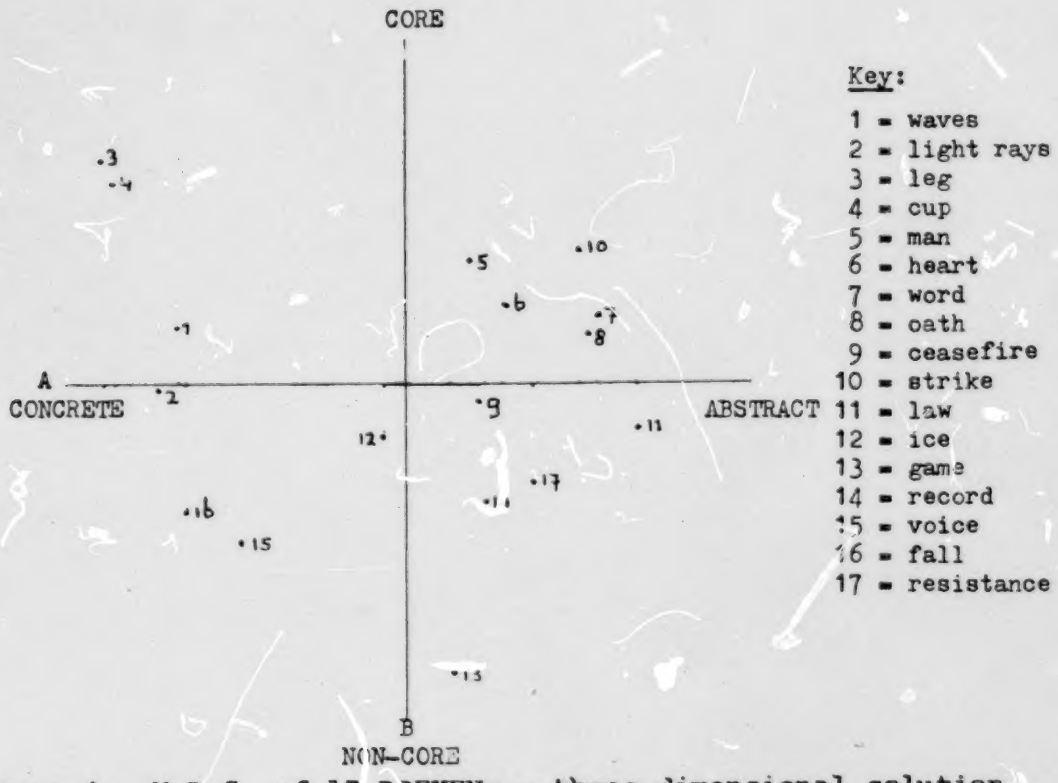

Figure 4: M.D.S. of 17 BREKENs - three-dimensional solution

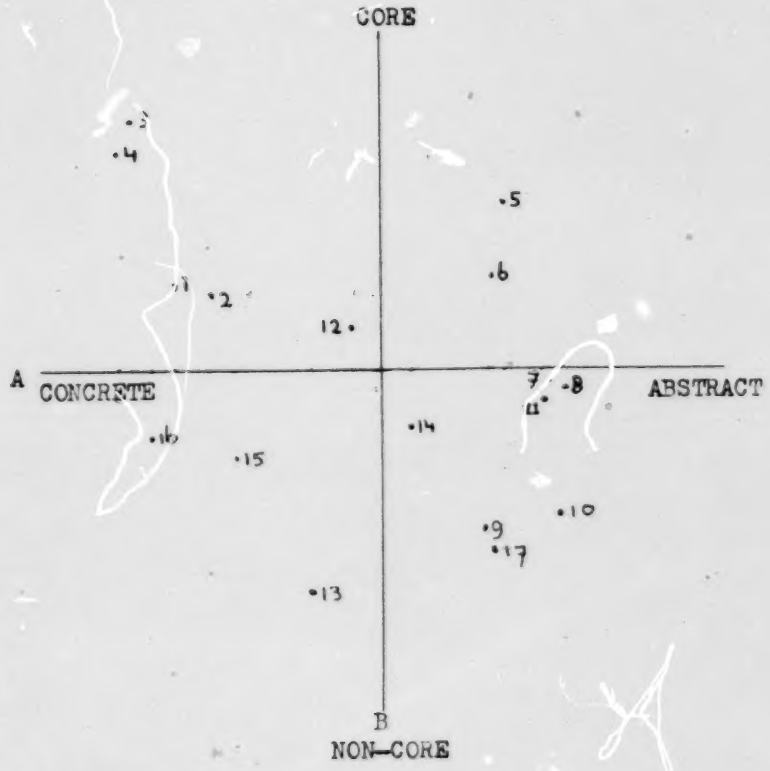

Figure 5: M.D.S. of 17 BREKENs - two-dimensional solution

In Figure 4, dimension A seems to divide 'high imagery' BREKENs from 'low imagery' or abstract ones, with BREKEN 12 (ice) occupying a mid-position. This probably reflects subjects' uncertainty in dealing with it, since while 'the ice was finally broken' is clearly idiomatic as used here, any consideration of the meaning of BREKEN within the expression must lead to a concrete interpretation.

The two-dimensional solution is not dissimilar (Figure 5), with the same clear division of high and low imagery meanings. One noticeable difference between the two figures is the position of BREKEN 10 (strike). This difference will be relevant to the predictions about transferability, of course. Here are the rank orders of the meanings along the 'imagery' dimension for the two solutions:

3D		2D
meaning	rank order	meaning
cup	1	cup
leg	2	leg
light rays	3	fall
waves	4	waves
fall	5	light rays
voice	6	voice
ice	7	game
man	8	ice
game	9	record
record	10	resistance
heart	11	heart
strike	12	man
ceasefire	13	ceasefire
resistance	14	oath
oath	15	word
word	16	law
law	17	strike

Table 5: Rank orders of meanings along a putative imagery dimension, three- and two-dimensional solutions

Dimensions B in Figures 4 and 5 look intuitively like 'coreness' dimensions with metaphorically extended meanings like 'heart' and 'man' being placed higher up the scale than some literal BREKENs. The rank orders of the meanings along the 'coreness' dimension for both solutions is as follows:

3D meaning	rank order	2D meaning
leg	1	leg
cup	2	cup
strike	3	man
man	4	heart
heart	5	waves
word	6	light rays
waves	7	ice
oath	8	word
light rays	9	oath
ceasefire	10	law
law	11	record
ice	12	fall
resistance	13	voice
record	14	strike
fall	15	ceasefire
voice	16	resistance
game	17	game

Table 6: Rank order of meanings along a putative 'coreness' dimension, three- and two-dimensional solutions

The two 'imagery' rank orders correlate well with each other (Spearman's ρ = .985, significant at $<$ .0005), as do the two 'coreness' orders (ρ = .721, significant at $<$ .005). Since there is no a priori method for determining which of the two solutions is the best, and since they correlate with each other so strongly, both the three- and the two-dimensional rank orders will be compared to transferability data derived from the experiments about to be described.

The first transferability experiment

Students and school-children (n = 210), all of whom were learning English, were given a list of the same nine sentences as used in the native speaker intuition investigations, plus one filler to make a round number, and asked to decide whether the BREKEN in each sentence could be translated by BREAK. If they thought it could, they were to mark the sentence with a cross. Otherwise, if BREAK could not be used, they were to write nothing.

Subjects were arranged in groups as follows:

	Group	Codename	Number
Nijmegen Univ.:	2nd year students of English, 1976/77 (tested at end of academic year 1976/77)	(KU2)	26
	1st year students of English, 1976/77 (tested at end of academic year 1976/77)	(KU1)	50
	1st year students of English, 1977/78) (tested at beginning of academic yr.77/78)	(KU0)	33

	Group		Codename	Number
Titus Brand-	6th year pupils	1977/78	(A6)	17
sma Secondary	5th year pupils	"	(A5)	23
School, Oss:	4th year pupils	"	(A4)	18
	3rd year pupils	"	(A3)	20
	2nd year pupils	"	(A2)	23

Every acceptance of BREAK was scored as a plus (+), every rejection as a minus (-). The intergroup acceptance figures, expressed in percentages of total possible acceptances, are as follows (raw scores in brackets):

Sentence number	KU2	KU1	KUO	A6	A5	A4	A3	A2	TOTALS	mnemonic
	Group									
1	54 (14)	32 (16)	18 (6)	12 (2)	4 (1)	11 (2)	25 (5)	39 (9)	26 (55)	'waves'
2	54 (14)	40 (20)	12 (4)	0 (0)	0 (0)	6 (1)	20 (4)	9 (2)	21 (45)	'voice'
3	81 (21)	64 (32)	76 (25)	82 (14)	100 (23)	100 (18)	100 (20)	83 (19)	82 (172)	'cup'
4	19 (5)	32 (16)	6 (2)	6 (1)	13 (3)	22 (4)	20 (4)	48 (11)	22 (46)	'fall'
5	88 (23)	70 (35)	88 (29)	82 (14)	26 (6)	56 (10)	45 (9)	48 (11)	66 (139)	'word'
6	81 (21)	80 (40)	64 (21)	65 (11)	48 (11)	72 (13)	70 (14)	52 (12)	68 (143)	'man'
7	96 (25)	100 (50)	97 (32)	100 (17)	96 (22)	100 (18)	100 (20)	83 (19)	97 (203)	'leg'
8	65 (17)	52 (26)	45 (15)	59 (10)	0 (0)	44 (8)	20 (4)	57 (13)	45 (94)	'record'
9	88 (23)	98 (49)	97 (32)	94 (16)	74 (17)	94 (17)	90 (18)	70 (16)	89.5 (188)	'heart'

Table 7: Acceptance scores, Nijmegen and Oss

These figures give us a series of rank orders per group, ranging from 'most acceptable' (most pluses) to 'least acceptable' (most minuses) sentences.

Rank order	KU2	KU1	KUO	A6	A5	A4	A3	A2	OVERALL
	Group								
1	leg	leg	leg	leg	cup	leg	leg	leg	leg
2	heart	heart	heart	heart	leg	cup	cup	cup	heart
3	word	man	word	cup	heart	heart	heart	heart	cup
4	cup	word	cup	word	man	man	man	record	man
5	man	cup	man	man	word	word	word	man	word
6	record	record	record	record	fall	record	waves	word	record
7	voice	voice	waves	waves	waves	fall	record	fall	waves
8	waves	waves	voice	fall	record	waves	fall	waves	fall
9	fall	fall	fall	voice	voice	voice	voice	voice	voice

Table 8: Rank orders of acceptance scores by group, Nijmegen and Oss

Discussion of these results will be delayed till after the second experiment has been described.

The second transferability experiment

The second experiment is essentially the same as the first, except that the number of BREKENs is now increased to 17, in order for comparisons between the second multidimensional scaling of intuitions based on card sorting and transferability to be made. Hence the 17 items in this experiment are those used in the latter scaling.

Subjects (n = 81) were drawn randonly from first and third year students at the English Department, Utrecht University. The first year group consisted of 50 subjects (U1), and the third year of 31 subjects (U3). Three 'filler' sentences were added to the 17 sentences to make a round number and sentences were typed, one per small sheet of paper and made into booklet form. Otherwise procedures were unchanged.

The group acceptance figures, expressed in percentages of total possible acceptances, are as follows (raw scores in brackets):

	1st Yrs	3rd Yrs	TOTALS	mnemonic
1	36 (18)	55 (17)	43 (35)	'waves'
2	30 (15)	32 (10)	31 (25)	'light rays'
3	100 (50)	100 (31)	100 (81)	'leg'
4	82 (41)	74 (23)	79 (64)	'cup'
5	74 (37)	77 (24)	75 (61)	'man'
6	96 (48)	100 (31)	97.5 (79)	'heart'
7	78 (39)	68 (21)	74 (60)	'word'
8	60 (30)	55 (17)	58 (47)	'oath'

Table continued next page

	1st Yrs	3rd Yrs	TOTALS	mnemonic
9	34 (17)	35 (11)	35 (28)	'ceasefire'
10	14 (7)	6 (2)	11 (9)	'strike'
11	42 (21)	42 (13)	42 (34)	'law'
12	32 (16)	55 (17)	41 (33)	'ice'
13	14 (7)	13 (4)	14 (11)	'game'
14	58 (29)	71 (22)	63 (51)	'record'
15	16 (8)	29 (9)	21 (17)	'voice'
16	22 (11)	19 (6)	21 (17)	'fall'
17	34 (17)	16 (5)	27 (22)	'resistance'

Table 9: Acceptance scores, Utrecht

These figures give the following rank orders, ranging from 'most acceptable' to 'least acceptable':

Rank	U3	U1	OVERALL
1	leg*	leg*	leg*
2	heart*	heart*	heart*
3	cup*	man*	cup*
4	word*	cup*	man*
5	man*	record*	word*
6	oath	word*	record*
7	record*	oath	oath
8	law	waves*	waves*
9	waves*	ice	law
10	ceasefire	law	ice
11	resistance	ceasefire	ceasefire
12	ice	light rays	light rays
13	light rays	voice*	resistance
14	fall*	fall*	fall*
15	voice*	resistance	voice*
16	game	game	game
17	strike	strike	strike

Table 10: Rank orders of acceptance scores, Utrecht (items also appearing in previous experiment marked with an *)

The correlation between the two groups, U3 and U1, is high (ρ = .919, significant at < .0005).

Comparison of results of the transferability experiments

If we compare the ranking of the nine original items across all ten groups used in the experiments, it will be clear that the Utrecht sample is not substantially different in its behaviour from the earlier sample. The coefficient of concordance, W, based on the rank orders of the nine original items for the ten groups, is .9047, significant at < .001. Thus the rank orders are very closely related to each other.

What is therefore noteworthy is this consistency between groups, despite the range of ages and experience in the sample. The conclusion one must reach is that the ten groups are drawn from essentially the same population, qualitatively speaking, and that the effects of teaching, learning and growing older do not significantly alter learners' beliefs about the relative transferability of the BREKENs. Clearly we are dealing with an implicational series of items of considerable generality. The overall order for all 291 subjects is:

1 leg
2 heart
3 cut
4 man
5 word
6 record
7 waves
8 fall
9 voice

Table 11: Overall rank order of transferability for ten groups

Thus, it is characteristic of the sample that if any item in the rank order is accepted by a group as transferable (i.e. marked '+'), by implication so are all those items higher in the overall order, and similarly if any item in the order is not accepted as transferable, neither will the items below it be accepted. The usefulness of using items which <u>are</u> all translatable into English is that rejection by a subject is a clear indication that a learner is in some sense using his intuition and has no 'real' knowledge. An acceptance, on the other hand, may well be the result of either guessing, 'belief' or 'real' knowledge.

The overall rank order is intuitively satisfying in that those meanings hypothesised as 'core' are among the most

transferable ('leg' and 'cup'). What is also evident is that metaphorical extensions of 'core' meanings like 'heart' or 'man' are also seen as transferable, indicating perhaps that the feature [+metaphor] is not such a crucial factor in transfer as 'coreness'. It would be logical, however, to expect metaphor to play some role to the extent that a literal meaning should always be more transferable than its metaphorical extension. A further comment needs to be made, then, on the quite evident sample preference for 'heart' over 'cup'. Even allowing for what has been called 'the pop-song effect' in respect of 'heart', there seems little reason why this preference should exist on semantic grounds. A glance at acceptance scores shows that in groups A2, A3, A4 and A5, 'leg' and 'cup' are equally acceptable, as one would expect. In A6 there is some difference as there is in KU2. In KU1, KUO, U3 and U1 the differences are marked. The higher the proficiency level the greater the difference in acceptability between these two items, generally speaking.

A reason for this phenomenon can be found in the discussion of grammatical markedness and the effect of 'surface structure meaning scanning' above, as well as in elicitation of verbal comment from learners. In 'hij brak zijn been' ('he broke his leg') BREKEN/BREAK appears in its causative-transitive guise. In "t kopje brak' ('the cup broke') BREKEN/BREAK is non-causative and intransitive. There are relatively few verbs in either English or Dutch which have both roles, and probably the intransitive form is less frequent. Thus it is 'marked'. More sophisticated learners who have a better grasp of the finer grammatical details of their own language and whose English is excellent have rejected the possibility of translating or accepting in translation the intransitive form in English, because, as they would have it, "in English, something can't just break, it has to be broken." What they feel is lacking is agency. Thus, for them, <u>someone broke the cup</u>, or <u>the cup was broken</u> are to be preferred to <u>the cup broke</u>, or, as some students suggest, another verb should be used, like <u>smash</u> which can be used intransitively, and although these students will have encountered BREAK far more frequently than <u>smash</u>, they have still not learnt to use it intransitively, because, it seems, the Dutch language will not let them. No such stricture attaches to <u>smash</u> since <u>smash</u> has no one-to-one lexical equivalent in Dutch which can be used intransitively (and the substitution of [the cup] <u>smashed</u> for <u>broke</u> also shows that these students do recognise the existence of the intransitive-transitive relationship in English).

The predictive power of the putative 'core' dimension for the transferability of BREKEN

a) Predictions for the original nine items

If we now return to the rank orders of meanings along the 'core' dimensions derived from multidimensional scaling, and compare these with the rank orders derived from the transferability experiments, it will be seen that there is generally a strong correlation between the two.

Transferability data per group	I		II		III	
	S	sig	S	sig	S	sig
KU2	17	•05	17	•05	21	<•05
KU1	19	<•05	17	•05	21	<•05
KU0	17	•05	21	<•05	23	<•05
A6	21	<•05	23	<•01	27	<•005
A5	21	<•05	27	<•005	27	<•005
A4	21	<•05	25	<•005	29	<•001
A3	24	<•01	28	•001	30	•0005
A2	15	—	21	<•05	27	<•005
U3	22	•01	20	<•05	23	<•01
U1	22	•01	24	<•01	28	•001
TOTAL	24	<•01	26	<•005	28	•001

Note: I, II, III refer to methods of data gathering in intuition investigations.
I = judgments of dissimilarity
II=card sorting, two-dimensional solution
III=card sorting, three-dimensional solution

Table 12: Significance levels of correlations between rank orders of 'coreness' and rank orders from transferability data, using Kendall's measure of disarray, S (the larger the value of S, the greater the correlation)

As will be seen from the above, scaling derived from card sorting produces better correlations with the original nine items, although all the correlations bar one are significant. Thus the card sorting method leads to more powerful predictions in addition to its other advantages already discussed. It should also be noted that the three-dimensional solution provides better predictions than the two-dimensional. Additionally, correlations tend to get stronger as the proficiency level declines. This suggests that knowledge does indeed play an increasing part in rank ordering as proficiency increases. However, since in A2 correlations get weaker again, one cannot attach too much importance to this phenomenon, even though it is broadly compatible with the theoretical assumptions expressed here.

b) Predictions for seventeen items

If we now compare the rank orders for 17 items deriving from card sorting with the transferability data for these items from Utrecht, the correlations are again high.

	II		III	
	ρ	sig	ρ	sig
U3	•836	< •0005	•590	< •01
U1	•744	< •0005	•686	< •005
TOTAL	•837	< •0005	•639	< •005

Note:
II = two-dimensional solution
III= three-dimensional solution

Table 13: Significance level of correlations between rank orders of 'coreness' and rank orders from transferability data, using Spearman's ρ

Here, it is clear that the two-dimensional solution gives very much better results. However, as we have seen, 'strike' seems unnaturally high on the 'coreness' dimension in the three-dimensional solution. What is more it is of low transferability. The effect of this item on the correlation is substantial, and if it is removed, the resultant rank orders of 16 items correlate extremely highly (ρ = .987, significant at < .0005), using the three dimensional solution.[6]

It should be pointed out that the 'concrete-abstract' rank orders in either solution do not correlate significantly with the transferability data (three-dimensional order and transferability order, ρ = 0.057, two dimensional, ρ = 0.129).

To test the hypothesis that the order of transferability (if not the degree) should remain fairly constant whatever the TL, since transferability is partially a reflection of NL intuitions, 40 Dutch learners of German at Nijmegen (1st and 3rd year students) were given the nine-item transferability test; the instructions were modified to take German grammar into account so that subjects could accept either ZERBRECHEN or BRECHEN (+) as a translation of BREKEN, or reject them both (-).

The resulting transferability rank order, based on acceptances, is:

	% acceptances
1. cup	100
2. leg	100
3. heart	92.5
4. word	62.5
5. man	50
6. waves	37.5
7. voice	37.5
8. record	35
9. fall	22.5

Table 14: Transferability rank order for Dutch learners of German

Correlation with the 'coreness' rank orders from card sorting is as follows (Kendall's S):

	II	sig	III	sig
S	24	$< .01$	24	$< .01$

Table 15: Significance level of correlations between rank orders of 'coreness' and rank orders from transferability data, using Kendall's measure of disarray (S)

Thus, for this sample of learners of German, the transferability of the BREKENs is also predictable.[7]

Conclusions

The results given above show that for BREKEN, native speakers' intuitions about semantic space can be used to predict the transferability of BREKEN as the morphosyntactic representation of various meanings. Card sorting seems to be an effective means of tapping these intuitions, and multidimensional scaling an appropriate method of processing the data.

No definition of how meanings may be placed on a scale of 'coreness' has been offered. It is conceivable that the dimensions which have been so labelled are actually composites of which 'coreness' forms a part. However, the notion of 'core' is intuitively satisfying. Furthermore there is anecdotal evidence that learners operate selectively in the range of meanings represented by a single 'word' they transfer.

On page 68 four questions were formulated, which can now be collectively answered. Firstly, the arrangement of meanings

equidistant from core, but not occupying the same sector of space, does affect transferability. Secondly, metaphorical extensions of core meanings are judged as dissimilar to literal 'core', yet may be more transferable than literal meanings judged less dissimilar. Thus there is no simple relationship between linear distance from core and transferability. Thirdly, 'concrete' meanings are not necessarily more transferable than 'abstract' ones, as has just been stated. However, in the case of meanings which are only distinguished by + or - [metaphor] (or high and low imagery), the literal meaning will probably be more transferable. Though high imagery has been shown to correlate with judgments of grammaticality, there was no correlation between high imagery and transferability.

One clear problem that needs to be faced is that the dichotomous data (+ or -) gleaned from the transferability experiments suppress information that is potentially valuable. The differences between + and - can after all be very small. While in some cases, the student may say 'this is definitely transferable (+), and this definitely not (-)', there may well be cases where the decision to assign a + or a - may almost be arbitrary, and unstable. While rank orders for large enough groups will probably be a reflection of these relative uncertainties, at the individual level no certainty-uncertainty ordering is possible. Perhaps some kind of hierarchical question scheme might be effective, where the first question would be 'Would a native speaker of your TL understand you correctly if you translated X directly into the TL?' A 'no' here would imply that the learner would not use the translated form himself and that he thought it incorrect anyway. A 'yes' would lead to other questions, such as 'would you use it?' A 'yes' here could then lead to the question 'is it English?' A 'no' would fairly certainly imply a 'no' to the last question as well.

Another method, used widely in experimental psychology, is reaction-time testing, and this seems applicable to the kind of material described here. A longer reaction time to a stimulus like 'can this be translated directly?' will indicate the amount of difficulty a decision entails, while a shorter one, leading either to 'yes' or 'no' indicates less difficulty. In this way one might be able to weight dichotomous responses.

The fact that transferability does seem predictable for two TLs, English and German, with Dutch as NL, does not prove the point for all languages. Nor does it prove anything but the fact that there is a scale of transferability for BREKEN. However, the results provide sufficiently positive indications to encourage further experiments of this kind, with different aspects of the grammatical system and different NLs and TLs.

It may not be idle speculation even at this point to suggest that if NL intuitions do monitor transferability, then using some of the techniques described here may give new life to the old aspirations of contrastive analysis. A psycholinguistic analysis of linguistic systems in the native language might enable us to some degree to discover in advance what aspects of the TL will be difficult to learn because of built-in resistance occasioned by the structure of the NL itself.

Notes

1. Acknowledgement is due to a number of people for help with this paper. Firstly to Erik Schils and Theo v.d. Weegen who helped with statistics and computers. Secondly to Marjan Leavis and Mike Sharwood Smith for arranging subjects. Thirdly to Craig Chaudron, Pit Corder, Carl James and especially Herman Wekker for comments and criticism. Fourthly to Peter Jordens for fruitful ideas and discussions 'around' this paper and much else. Fifthly to Pim Levelt for advice on experimental techniques in this paper and for the future. Sixthly, a special note of thanks to Dianne Kramer for her excellent editorial assistance and for doing a lot of the statistical donkey work. Finally, I would like to express my gratitude to Toni Rietveld, whose interests normally lie elsewhere, but who nevertheless went to considerable pains to shape and refine the statistical elements in this paper and whose insights into the particular nature of this work more than once saved the day.

2. Corder (forthcoming) suggests that I am really talking about communication strategies when proposing that learners have notions of what is language-specific in their NL. This is not entirely correct, since I would not wish to make a hard and fast division between learning and communication strategies. Instead we should be thinking of a gradient in transfer as a strategy. At one end of the gradient, transfer may have become an automatic process, the learner believing that what he produces <u>is</u> the TL, perhaps because of past reinforcement. At the other end of the gradient we find what may be called 'desperation strategies' where the learner uses a NL form to try to ensure communication, even though to do so may be against his better judgment. However, I believe that it is only at this end of the gradient that transfer may not be principled. We must also allow for the fact that at any given moment learners may have different goals. Simply stated, the learner may be content to get his message across at the expense of TL accuracy. He may thus use NL forms in the TL which he feels may not be phraseologically acceptable or grammatical but will carry the meaning across nevertheless. At another time, he may be concerned with phraseological and grammatical accuracy as well as with the message.

3. 'Avoidance' is a topic that is being investigated in addition to interference, but as the term is used in the literature it is not the same as failure to transfer on the basis

of assigning a language-specific label to certain NL items. Avoidance comes about as the result of contact with the relevant structure in the TL, and it is because the TL structure is seen as so different from its NL counterpart, and thus difficult, that learners avoid it altogether. Schachter (1974) claims that such avoidance 'errors' could only be accounted for by a predictive contrastive analysis, but non-transfer phenomena of the kind under discussion in this paper, being dependent on intuitions about the native language, are not predictable by an orthodox contrastive analysis.

4. Wekker (personal communication) correctly points out that this 'deep' meaning also includes many other 'change of state' verbs, like close, open, kill, alter, etc., etc. However, all that I intend is to show that there is at least one fairly abstract feature common to all the BREAKs, which cannot be said for 'words' like trunk.

5. Levelt (personal communication) suggests this interpretation for the dimensions produced by the card sorting method discussed below rather than any linguistic one. Though non-linguistic in itself, imagery (or imaginability) has been shown to correlate highly with judgments of grammaticality (i.e. high imagery structures are judged more grammatical than low imagery structures (Levelt, et al., 1977). Be that as it may, it will be evident from what follows that 'high imagery' has at best only a marginal role to play in transfer when compared with 'coreness'.

6. The very nature of MDS solutions means that 'rogue' items may well appear which are, in fact, non-significant and could be 'put in their place' so to speak. Hence this apparent aberration says less about intuitions than about MDS.

7. Dianne Kramer, a student assistant, conducted a small enquiry with Dutch Esperantists, who collectively translated the nine original items into Esperanto. This is an interesting exercise, since there is no authoritative source for judging the correctness of the translation, Dutch-Esperanto dictionaries being little more than phrasebooks. Hence, it is not surprising that the resultant dichotomous data resemble the overall transferability rank order produced by the learner of English. I hope to use Esperantists with different NLs in the future. Additionally the BREAK test is now being conducted with Dutch learners of French, and will be conducted in the future with English learners of various TLs.

Bibliography

Corder, S.P. (forthcoming): "Language-learning language." To appear in J.C. Richards, ed. Understanding Second Language Learning, Issues and Approaches.

Greenbaum, S., ed. (1977) Acceptability in Language, Mouton.

Kellerman, E. (1977) "Towards a characterisation of the strategy of transfer in second language learning." Interlanguage Studies Bulletin, 2/1, 58-145.

Lehrer, A. (1974) "Homonymy and polysemy: measuring similarity of meaning." Language Sciences, Oct. 1974, 33-38.

Levelt, W., J. van Gent, A. Haans, A. Meyers (1977) "Grammaticality, paraphrase, and imagery." In Greenbaum, op cit. 87-101.

Miller, G. (1969) "A psychological method to investigate verbal concepts." Journal of Mathematical Psychology, 6, 169-191.

Schachter, J. (1974) "An error in error analysis." Language Learning, 24, 205-214.

Van Lancker, D. (1975) "Heterogeneity in language and speech." UCLA Working Papers in Phonetics, 29.